KSSM F5

BAB 2 : MATRIKS

Baris

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

Lajur

-Peringkat matriks:-

Formula : Baris x Lajur

$\rightarrow$ 2 x 2

$$\begin{bmatrix} -1 \\ 0 \\ 3 \end{bmatrix}$$ 3 x 1

$$\begin{bmatrix} 2 & 0 & 4 \\ 3 & 7 & -2 \end{bmatrix}$$ 2 x 3

$$\begin{bmatrix} 4 & -1 & 6 \end{bmatrix}$$ 1 x 3

-matriks sama-

① Peringkat sama

② unsur sama

$$A = \begin{bmatrix} 0.2 & -4 \\ 1 & 7 \end{bmatrix} \quad B = \begin{bmatrix} \frac{2}{10} & -4 \\ 1 & 7 \end{bmatrix}$$

1) Peringkat A : 2x2 B : 2x2

2) unsur A : 0.2, B = $\frac{2}{10}$ = 0.2

Semua unsur sama.

$\therefore A = B$

$$C = \begin{bmatrix} -1 & 4 \\ 0 & 7 \end{bmatrix} \quad D = \begin{bmatrix} 7 \\ 4 \end{bmatrix}$$

1) Peringkat

A : 2x2

B : 2x1

$\therefore C \neq D$

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- Operasi Tambah & Tolak Matriks -

$$\begin{bmatrix} 2 & -1 \\ 4 & -3 \end{bmatrix} + \begin{bmatrix} 4 & 3 \\ 7 & 2 \end{bmatrix} = \begin{bmatrix} 2+4 & -1+3 \\ 4+7 & -3+2 \end{bmatrix}$$

$$= \begin{bmatrix} 6 & 2 \\ 11 & -1 \end{bmatrix}$$

$$\begin{bmatrix} 2 & -1 \\ 4 & -3 \end{bmatrix} - \begin{bmatrix} 4 & 3 \\ 7 & 2 \end{bmatrix} = \begin{bmatrix} 2-4 & -1-3 \\ 4-7 & -3-2 \end{bmatrix}$$

$$= \begin{bmatrix} -2 & -4 \\ -3 & -5 \end{bmatrix}$$

- Operasi Darab - (Klu : Peringkat)

① $\begin{bmatrix} 1 & 2 \\ -2 & 4 \end{bmatrix} \begin{bmatrix} -1 \\ -7 \end{bmatrix}$ = Jawapan mestilah dlm peringkat 2×1

Peringkat: 2×2 2×1 = 2×1

$$= \begin{bmatrix} 1\times(-1) + 2(-7) \\ -2\times(-1) + 4(-7) \end{bmatrix}$$

$$= \begin{bmatrix} -1 + (-14) \\ 2 + (-28) \end{bmatrix}$$

$$= \begin{bmatrix} -15 \\ -26 \end{bmatrix}$$

② $\begin{bmatrix} 1 \\ 4 \end{bmatrix} \begin{bmatrix} 3 & 2 \end{bmatrix}$

P: 2×1 1×2 = (2×2)

$$= \begin{bmatrix} 1\times3 & 1\times2 \\ 4\times3 & 4\times2 \end{bmatrix}$$

$$= \begin{bmatrix} 3 & 2 \\ 12 & 8 \end{bmatrix}$$

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- matriks identiti -

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \quad \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

matriks A x matriks identiti = matriks A

$A \times I = A$, $I \times A = A$

- matriks songsang -

$$M = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \quad M^{-1} = \frac{1}{ad - bc} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

( ) a dan d : tukar tempat, simbol tukar
( ) b dan c : kekal tempat, simbol tukar ($\times (-1)$)

Contoh:

$$A = \begin{bmatrix} a & b \\ 3 & -5 \\ 2 & -7 \\ c & d \end{bmatrix}$$

$$A^{-1} = \frac{1}{ad - bc} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

$$= \frac{1}{3(-7) - (-5)(2)} \begin{bmatrix} -7 & 5 \\ -2 & 3 \end{bmatrix}$$

$$= \frac{1}{-21 - (-10)} \begin{bmatrix} -7 & 5 \\ -2 & 3 \end{bmatrix}$$

$$= \frac{1}{-11} \begin{bmatrix} -7 & 5 \\ -2 & 3 \end{bmatrix} @ \begin{bmatrix} \frac{7}{11} & -\frac{5}{11} \\ \frac{2}{11} & -\frac{3}{11} \end{bmatrix}$$

Tips
① Label dulu a, b, c, d
② Ganti nilai ikut formula

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